

Rhodora

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Conducted and published for the Club, by
REED CLARK ROLLINS, Editor-in-Chief

ALBERT FREDERICK HILL STUART KIMBALL HARRIS RALPH CARLETON DEAN CARROLL EMORY WOOD, JR. IVAN MACKENZIE LAMB	}	Associate Editors
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THE HYBRID RAGWEED, *AMBROSIA ARTEMISIIFOLIA* \times *TRIFIDA*

W. H. WAGNER, JR.¹

One of the more striking of all weed hybrids is certainly the cross between the "common ragweed" and the "giant ragweed"—*Ambrosia artemisiifolia* \times *trifida*. The parents differ strongly in habit, stature, leaf-form, and fruits, producing in their cross a distinctive plant. During recent studies of the parental species I have encountered occasional naturally occurring examples of this rare cross, and I wish to report here some observations not previously recorded.

The hybrid between our two most pernicious of hayfever weeds was first discovered and described by Wylie in 1915. Subsequent authors for the most part seem not to have noticed this early paper. A single plant was found during the summer of 1914 on a roadside about 2 miles north of Iowa City, Iowa. It produced flowers in abundance but no seeds were formed, although Wylie observed the plant closely until autumn. It is significant that none of the later writers has reported seeds (or fruits) either. The leaves of the new hybrid were described as "distinctly different from either of the supposed parents, though intermediate between them in a general way," and one of the leaves was figured (op. cit., pl. 21) together with comparable leaves of the parents.

Since Wylie's original description, various observations on *Ambrosia artemisiifolia* \times *trifida*, both from North America and Europe, have been published. However, in his revision of

¹ Publication No. 10 on *Atmospheric Pollution by Aeroallergens* under research grant No. E-1379(C) from the National Institute of Allergy and Infectious Diseases, Public Health Service.

Ambrosia in *North American Flora* Rydberg in 1922 did not mention Wylie's plant, including only another hybrid ragweed, *A. bidentata* \times *trifida*. K. L. Jones (1943) did cite Wylie's original report and also recorded another example of the wild hybrid which was found in 1936 along the banks of the Huron River near Ann Arbor, Michigan. Jones, in genetic experiments, also created the hybrid under artificial conditions by growing the all-pistillate form of *A. artemisiifolia* together with pollinating plants of *A. trifida*. Of the seven hybrid plants that he secured, two inherited the all-pistillate condition of the *artemisiifolia* female parent, four were intergrades, and one was normally monoecious. In cytological studies of the cross, he determined that the 12 chromosomes in the haploid set of *A. trifida* are recognizably larger than the 18 from *A. artemisiifolia*. Chromosome pairing was found to be irregular and there were numerous univalents. Such pairing as occurred involved almost entirely chromosomes of similar size and therefore were assumed to have been contributed by the same parent. Stebbins (1945) called attention to this as a striking example of pairing between chromosomes contributed by the same parent in species hybrids involving polyploidy.

Rouleau in 1944 redescribed *Ambrosia artemisiifolia* \times *trifida* on the basis of a collection made in Canada in 1935, and gave it the binomial " \times *Ambrosia Helenae*," in honor of Hélène Boulé, for whom Ile Sainte-Hélène, where the hybrid was discovered near Montreal, was also named. In 1939, Ballais found the cross at Cauderan (Giroude), France, where the parent species have been introduced (Lawalrée, 1947). In 1950 the intermediate was taken at Urbana, Champaign Co., Illinois, by Marilyn L. Briggs (Jones and Fuller, 1955).

Although we now have records in our notes only from Iowa, Illinois, Oklahoma, Michigan, Quebec, and France, *Ambrosia artemisiifolia* \times *trifida* will probably be detected from time to time wherever the two parents grow together in ruderal habitats. In Michigan, as mentioned previously (Wagner & Beals, 1958), this ragweed cross is extremely rare. Such few specimens as we have found during 1956, 1957, and 1958 have been in much disturbed habitats, along the sides of newly built roads and on construction sites in and around Ann Arbor.

Despite its somewhat unique appearance the hybrid may be passed unnoticed, or may even be confused with other species. There are probably unrecognized specimens in various herbaria. To illustrate, in the herbarium of Tulane University I found in 1958 an example of this ragweed cross from Pawnee, Oklahoma (August, 1933, *C. F. Coffman*) that was identified as *Ambrosia psilostachya*, the "perennial" or "western ragweed." Another specimen reported for the first time here was found in 1957 in the much-used herbarium of the University of Michigan Biological Station. The latter (East Cheboygan, Michigan, July 30, 1933, *J. H. Ehlers 5346*) bore the identification *A. artemisiifolia*, probably because on casual inspection it appeared like a very coarse individual of the common ragweed.

Part of the difficulty of recognizing *A. artemisiifolia* \times *trifida* surely results from the rather extraordinary variation in the successive leaves produced from spring through fall. The earlier leaves of the season are roughly like over-sized leaves of *A. artemisiifolia*, but the later leaves formed on the main and lateral axes are not comparable directly to those of either parent, having rather large, but narrowly three-lobed or simple blades. By late summer and fall, all the spring leaves have normally fallen or completely dried up so that only the more simple leaf types of the distal parts of the plant remain. At this stage the plant looks something like a narrow-leaved form of *A. trifida*.

To attempt to show all the normal foliar variations of this hybrid I decided to make observations of a single, as nearly average as possible, plant—from cotyledons to highest bract. To accomplish this it was necessary to find a natural hybrid very early in its growth, so that all the first leaves would be present and intact. On May 18, 1958, a specimen was found growing with the parents on a construction site at the University Hospital, Ann Arbor. With the assistance of Dr. John M. Sheldon this plant was extracted from a difficult position in a crack along the sidewalk with as little injury as possible, and it was turned over for cultivation to Mr. Walter F. Kleinschmidt, Superintendent of the U. M. Botanical Gardens, who kept it under approximately normal conditions. A sample leaf was removed from each node just before it dried and fell off naturally. The plant grew to 50 inches in height and seemed to be of fairly

average growth for this cross in Michigan, neither as small as Ehlers' specimen from Cheboygan, nor as large as the giant specimen grown under more luxuriant artificial conditions the previous year. The results from this "pruning" of the old leaves of successive nodes are shown in Figure 1.

The seedlings of the parent species have been described by Rowlee (1893) and Kummer (1951). In over-all stature the hybrid seedling is closer to *A. trifida* than *A. artemisiifolia*. The cotyledons and the first foliage leaves of the cross are readily distinguishable from the corresponding leaves of *A. trifida*. On the fourth to eighth nodes the leaves look somewhat like extremely gross leaves of *A. artemisiifolia* and their margins are lobed and toothed (fig. 1, especially the second row). This is the leaf type depicted by Wylie (op. cit., pl. 21). By the time the sixth pair of foliage leaves has appeared, there are already lateral branches growing from all except the lowermost nodes, a feature especially characteristic of *A. artemisiifolia* (Rowlee, op. cit.). At approximately the middle level of the plant, the opposite leaf arrangement gives way to alternate, in this respect also as in *A. artemisiifolia* rather than *A. trifida* which has opposite branching throughout. The leaves in the upper half of the plant tend to be progressively simpler in structure and finally, in the top five nodes, to become narrowly three-lobed to nearly simple, the margins now practically entire. The leaves illustrated by K. L. Jones (op. cit., figs. 2, 4, 5) are like the intermediate types found in the middle of the plant (fig. 1, third row).

The leaves produced on the lateral branches of this "average" hybrid are considerably smaller than those along the main axis. The three leaves (fig. 1, inset) from a branch at the sixth node (shown by the arrow) illustrate the most common types of leaves on the lateral branches. In extremely vigorous, large and much-branched specimens of *A. artemisiifolia* \times *trifida*, however, the lateral branches become more like the top half of the main axis of our average plant. This unusually large form is shown by the specimen of Rouleau (op. cit., fig. 3), and is represented in our collections by *Wagner 8461* (MICH) from near Ann Arbor Airport which was grown to exceptionally large size in the U. M. Botanical Gardens in 1957.

Fruits have apparently not previously been found in *Ambrosia*



FIG. 1. Leaf variations of *Ambrosia artemisiifolia* \times *trifida*. Lower left: Major branches of "average" plant 50 inches tall, showing successive nodes where leaves were removed. Silhouettes (to scale) of successive leaves arranged left to right—Bottom row, nodes 1-5; second row, nodes 6-8, third row, nodes 9-12, fourth row, nodes 13-16, top row, nodes 17-18 (18 at base of terminal spike). INSET: successive leaves from lateral branch shown by arrow in habit diagram. (Silhouettes photographed by T. F. Beals).

artemisiifolia \times *trifida*, and it is possible that the production of any fruits at all is atypical. Nevertheless, our natural hybrid, cited above, that was cultured in 1957 under particularly luxuriant conditions in the greenhouse and permitted to develop into an unusually large specimen was grown side by side with numerous pollinating plants of *A. artemisiifolia*, and by the latter half of September the hybrid did produce approximately twenty fruits—these having been stimulated to form, perhaps, by the

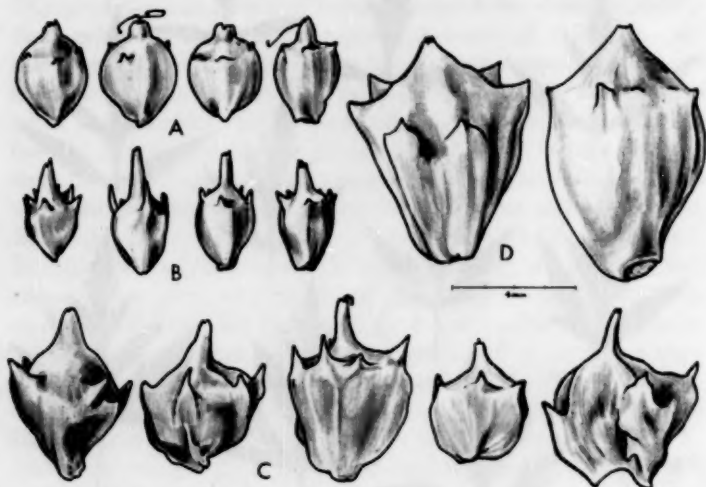


FIG. 2. Fruits of ragweeds. A. *Ambrosia coronopifolia*; B. *A. artemisiifolia*; C. *A. artemisiifolia* \times *trifida*; D. *A. trifida*.

pollen from the parent species. The fruits, the outer walls of which are involucreal in origin and appeared superficially to be normal, represent good intermediates between the rather different fruits of the parents as shown in the scale drawings in figure 2. The fruits of *A. artemisiifolia* average usually 4-5 mm. in total length, with a narrowly constricted beak that makes up one-third to one-half the length. Those of *A. trifida* are much larger, approximately double in over-all length, 7-10 mm., with a more broadly based beak that comprises one-fifth to one-fourth of the total length. The fruits of the hybrid are variable but all of those which did develop on the plant were intermediate both

in size and shape between those of the parents. The only major deviation is that the hybrid fruits tend to be more deeply channelled, a feature no doubt related to the collapse or failure of development of the achene within. Following after-ripening during the winter of 1957-58, an attempt was made to germinate some of the hybrid fruits, but without success. Both the pollen and the fruits (when formed) of this hybrid are probably ineffective in its reproduction.

Because of the great rarity and sporadic occurrence of this hybrid ragweed, and because of its probable inability to reproduce or even survive more than one summer by any means, I am inclined to designate it by formula only, i.e., as *Ambrosia artemisiifolia* \times *trifida*, rather than by formal binomial nomenclature, as *A. \times helenae*. There is considerably more justification, perhaps, for designating the ragweed hybrid, *A. artemisiifolia* \times *coronopifolia* with a taxonomic binomial as *A. \times intergradiens* (Wagner & Beals, op. cit.), because the latter hybrid is found to be frequent in many counties of Michigan (and probably elsewhere) and has the ability to form very large, perennial populations through the years by way of root proliferations. The question, however, of when or why it is "useful or necessary" to designate an interspecific plant hybrid with a binomial is at present wholly arbitrary and personal. It would be desirable if there existed a generally acceptable and sound philosophy as a guide in this regard.

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SOME INTERESTING RECORDS FROM EASTERN MASSACHUSETTS

RICHARD J. EATON

Middlesex and Norfolk Counties in eastern Massachusetts, particularly within a radius of thirty miles from downtown Boston, have been intensively explored during the past century by several generations of energetic botanists. The flora of that area is, perhaps, as well represented by herbarium specimens, and the detailed distribution of its specific elements is as well known, as that of any comparable area in the New World. It is, therefore, a source of constant interest and surprise that novelties (from a local point of view) continue to crop up in some numbers. Despite the accelerating contraction of suitable habitats for our native vegetation and the rapid conversion of rural areas to industrial, highway, and housing uses with all that that process implies, it is still profitable to rework familiar ground intensively in search of previously overlooked plants or recent arrivals.

The specimens cited below were collected by the author unless otherwise stated, and have been placed in the herbarium of the New England Botanical Club.

ISOËTES RIPARIA Engelm. Walden Pond, Concord, Middlesex County, Massachusetts, Sept. 22, 1957. Neither it nor its more northerly and hardly separable var. *canadensis* has been reported previously from the county. Even if considered as an aggregate, this species appears to be somewhat local in eastern New England: one record each from Cumberland and York Counties, Maine; one from Suffolk, three from Norfolk, and two from Worcester Counties, Massachusetts; two from Providence County, Rhode Island; two from Windham County, Connecticut.

ISOËTES MACROSPORA Dur. Walden Pond, Concord, Massachusetts, G. R. Proctor 3681-b, Aug. 29, 1949; same station, Sept. 22, 1957. New to Middlesex County, Massachusetts. Aside from three other stations in Massachusetts (Plymouth and Hampden Counties) this species appears to be confined to northern New England. Unaware of the Proctor collection,

I stumbled on it last fall while making a periodic "low-water" visit to Walden. It seems odd that the numerous keen botanists who have explored its shores and neighboring woods during the past hundred years should have previously overlooked two species of *Isoetes*. The suspicion is inevitable that they are recent arrivals, particularly in view of the ever-increasing hordes of bait fishermen and others who infest the pond.

CYPERUS ERYTHORRHIZOS Muhl. Two recent collections from Concord: Great Meadows, J. W. Brainerd 2569, July, 1950; shore of Walden Pond, Sept. 22, 1957. Previously known in Middlesex County only from Winter Pond, Winchester. Until 1930 this species was considered rare in southern New England where it reaches its northeast limit of range at two stations in Massachusetts on the bank of the Merrimack River in Essex County. It was known elsewhere in our area at two stations each in Norfolk and Bristol Counties, all in Massachusetts, and at a scattering of seven stations in the Connecticut River valley from Hadley, Massachusetts, to its mouth at Lyme, Connecticut. Since 1930, in addition to the two Concord stations cited above, it has been discovered at five places in the Blackstone River valley from Auburn (near Worcester), Massachusetts, southward to Providence, Rhode Island; and at two places along the upper (southern) Nashua River in eastern Worcester County. It is difficult to accept the idea that this well-marked and easily recognizable sedge previously had been overlooked in such a thoroughly botanized town as Concord.¹

More problematical is its status in Worcester County, Massachusetts, where active and competent botanists under the leadership of B. N. Gates and David Potter have been systematically collecting during the past twenty-five years. However, Joseph Jackson did intensive field work there (but without the benefit of motor transportation) in the 1890's while gathering material for his "Flora of Worcester County". During the next two decades, in addition to continued field work by local botanists, Messrs. Fernald, Knowlton, Hunnewell, and other members of the New England Botanical Club, either on formal field excursions or otherwise, visited the county more or less regularly. In short, its flora was reasonably well known to botanists of a preceding generation. Therefore, one must not dismiss the possibility, if not the probability, that *C. erythrorhizos* has invaded the Sudbury-Concord, Nashua, and Blackstone River valleys in recent years. If so, the reasons and agencies responsible for its possibly

¹ The New England Botanical Club Herbarium contains specimens from Concord representing more than 1050 species plus an additional 124 named varieties and forms, collected by forty persons beginning with H. D. Thoreau and E. S. Hoar in the 1850's.

After these notes were sent to the printer an old undated specimen has been found in the recently acquired herbarium of Mary Rodman. The label is inadequately annotated "Bedford—C. W. J." Evidently she received it from Charles W. Jenks, a contemporary amateur botanist of Bedford who collected actively in central Middlesex County beginning about 1880. It is physically possible that Jenks could have collected the plant in the Bedford section of the Concord River meadows, but there are good reasons for disregarding this possibility. Internal evidence strongly suggests that the specimen did not originate with Jenks or from Bedford.

sudden dispersal must remain obscure. One is tempted to correlate the postulated phenomenon with the remarkable increase in eastern Massachusetts of migrant waterfowl, in particular surface-feeding fresh water ducks, such as Black Duck, Wood Duck, Pintail, Blue- and Green-winged Teal.² This correlation probably is coincidental. The recent increases, in fact, merely represent partial recoveries from the steady decline of waterfowl along the eastern flyway since early Colonial times when their abundance appears to have been fantastic. Obviously, the opportunities for dispersal of the sedge by avian means in post-glacial times were far greater prior to 1700, for instance, than during the years 1930-1957.

CAREX HIRSUTELLA Mackenz. Open deciduous woods, Concord, Massachusetts, June 16, 1957. First record from Middlesex County. I find only two herbarium specimens from eastern New England: one from Mt. Desert, Maine, and one from Bristol County, southeastern Massachusetts. Otherwise, it appears to be confined to localities west of the Connecticut River from Vermont to Connecticut. Dr. F. J. Hermann concurs with my determination of the Concord specimen.

CAREX LAXIFLORA Lam., var. *SERRULATA* F. J. Herm. Lincoln, Middlesex County, Massachusetts, June 22, 1955, wooded rocky slope over diorite outcropping. Obviously closely related to *C. laxiflora*, but unlike anything to be expected in eastern Massachusetts, I sent the specimen to Dr. Hermann for his opinion. He assigned it unhesitatingly to this apparently local and seldom collected variety. This appears to be its first recorded occurrence in New England. There are only five specimens in the Gray Herbarium: one each from New York, Michigan, and Washington, D. C., and two from Tennessee. Dr. Hermann writes that he has seen a recent collection from an additional station in Michigan. Like the typical form, var. *serrulata* seems to prefer rich hardwoods. Incidentally, the Lincoln station, according to the detailed geological map of the region, lies on the same formation as that for *Parietaria pensylvanica* in Concord mentioned below. The formation is mapped as a narrow, gradually expanding ribbon from Marlborough to Salem, Massachusetts. Except near the coast, it reaches the surface as outcrops at but a few places; otherwise it is buried chiefly by the acid soils of glacial origin. The outcropping in Concord is noteworthy for its rich flora. It is the site of a number of species not known to occur elsewhere in the town and which are relatively rare and local in eastern Massachusetts. To a much lesser extent, the same is true of the less extensive Lincoln exposure.

WOLFFIA PUNCTATA Griseb. Concord, Massachusetts, Oct. 16, 1957, on quiet water in an artificial wild-fowl impoundment adjacent to the Great Meadows impoundments of the United States Wild Life Refuge. The presence of this species was discovered by Carroll E. Wood, Jr., while searching for fruiting fronds of *W. columbiana* in a sample I had collected for him for that purpose. A collection subsequently taken from a detached colony of the now locally abundant *W. columbiana*³ contained

² See "Birds of Concord" by Ludlow Griscom (Cambridge, 1949), pp. 153-154, 181-188, etc.

³ First discovered in eastern Massachusetts in 1938 and reported by the author in *Rhodora*, 41: 42.

roughly five per cent *W. punctata*. The latter species seems to float slightly higher in the water than the other and is somewhat boat-shaped. By running a cupful through a fine-meshed kitchen strainer to remove contaminating *Lemna*, etc., I was able to obtain a pure sample of the mixed *Wolffia* plants. Successive portions of the cleaned material were floated in a flat dish. By gently blowing across the surface, I found it possible to increase the percentage of *W. punctata* at the far edge to a marked degree, thus facilitating the preparation of a pure specimen of the latter species.⁴

This appears to be its first recorded occurrence in New England. Its range is stated by Fernald in Gray's Manual, 8th Ed., as "Fla. to Tex., n., very locally, to e. Md., n.w. N. Y., s. Ont., Mich . . .", etc. In connection with the possibility of the dissemination of aquatic vegetation by waterfowl, suitable ecological conditions at the place of deposition are essential for a successful introduction. In the case of the Lemnaceae, the sewage-polluted waters of the Sudbury-Concord River and particularly the Great Meadows impoundments adjacent to it are notoriously favorable for their luxuriant growth.⁵ Seemingly, the chances are excellent that a single frond of *Wolffia*, released from entanglement in some portion of the external anatomy of a migrant duck, for instance, onto the surface of one of these impoundments, should soon proliferate abundantly. It is considered well-nigh impossible for any vegetal material, viable or otherwise, to remain in the digestive tract of a bird during the time required for a flight from Maryland to eastern Massachusetts. Also, it is questionable whether *Wolffia* ever can stick to a bird's feathers. It is conceivable that it can stick to a strand of weed fouled in a bird's foot or bill. Very rarely I have seen a land bird with a claw or bill apparently fouled by extraneous material. One or two of my ornithological friends have observed similar occurrences. *Wolffia* adheres strongly by capillary attraction to moist surfaces. Such a means of long-distance transport seems possible. On the whole, I think it rather likely that both species of *Wolffia* are recent arrivals in Concord.

SISYRINCHIUM ARENICOLA Bickn. Braintree, Norfolk County, Massachusetts, R. B. Channell and R. J. Eaton, July 5, 1957. The previously known occurrence of this southern species in northeastern North America is indicated by specimens in the Club and Gray Herbarium from Woodbury, Connecticut, Block Island, Rhode Island, Marthas Vineyard, Nantucket, and Provincetown in Massachusetts, and thence (disruptedly) from southwestern Nova Scotia. This familiar distributional pattern is characteristic of a number of southern plants which are assumed to have migrated in the late Pleistocene northeastward along the exposed continental shelf, and to have become isolated at scattered marginal stations by subsequent rise in the ocean level. Hence, the occurrence of *S.*

⁴ For methods of preserving herbarium specimens of *Wolffia* see "Wolffia in Canada" by W. G. Dore in *The Canadian Field-Naturalist*, 71: 10-16.

⁵ See author's paper "Lemna minor as an aggressive weed in the Sudbury River". *Rhodora*, 49: 165-171.

arenicola on the mainland of Massachusetts in Norfolk County is somewhat surprising.

PARIETARIA PENSYLVANICA Muhl. Deciduous woods, base of dioritic outcrop,⁶ Concord, Massachusetts, Aug. 1, 1957. Previously unrecorded from Middlesex County. Except for three old records from the southerly outskirts of metropolitan Boston (one of which is definitely annotated "waste ground") its distribution in Massachusetts as reflected by the many specimens in the New England Botanical Club Herbarium is confined to the Connecticut River valley and westward, where rich woods species are notably numerous and abundant. The plant at Concord has every appearance of being indigenous. However, reference is made to *RHODORA* 1: 168-172 wherein *P. pensylvanica* is listed as one of the species said to have been unsuccessfully introduced at Concord by Minot Pratt (who died in 1878). Pratt, contrary to his usual practice, made no mention of the introduction in his "List of Plants of Concord" (ms. in the Concord Public Library).

BARTONIA PANICULATA (Michx.) Muhl. Shore of Bateman's Pond, Concord, Massachusetts, July 25, 1957. First record for Middlesex County. Previously known New England distribution: Cumberland and York Counties, Maine, one station each; Norfolk County, Massachusetts, three stations in the Blue Hills Reservation; thence westward near the coast in southeastern Massachusetts, Rhode Island and Connecticut.

CRATAEGUS CRUS-GALLI L. Concord, Massachusetts, July 25, 1957. Second record for the county, the first being Middlesex Fells, N. T. Kidder, June 8, 1928; otherwise not known in eastern Massachusetts, north of Bristol County. This species is one of the very few New England members of the genus which can be readily identified in the field. At the Concord station were three large and apparently old individuals and several smaller ones at the edge of extensive rocky open woodland in a long abandoned pasture.

VERNONIA MISSOURICA Raf. Clam Shell Bluff, Concord, Massachusetts, Aug. 21, 1957. Adventive from the West. Probably the first record for New England. It is included here as a previously overlooked addition to the long list of adventives at this station reported by the author in *RHODORA* 38:64-67. It has presumably persisted for nearly thirty years, despite the fact that all but narrow edges of the field recently has been put back into cultivation.

HIERACIUM PILOSELLA L. var. *NIVEUM* Muell. Arg. Old sterile field, Concord, Massachusetts, July 30, 1957, where it occurs as a dense clone several meters in diameter. Naturalized from Europe. Its occurrence in the Gray's Manual range is stated by Fernald as "Fields, e. Maine". Var. *niveum* strikingly differs from the frequently collected and wide-ranging typical form in that its leaves are permanently and conspicuously white panmose beneath. Furthermore, it appears to be far less aggressive.

—LINCOLN, MASS.

⁶ The pH of a finely powdered mixed sample was determined as 6.2.

CABOMBA CAROLINIANA GROWS IN WORCESTER COUNTY, MASSACHUSETTS

BURTON N. GATES

The distribution of *Cabomba caroliniana* A. Gray in Massachusetts is gradually unfolding. An important recent contribution is that of Stuart K. Harris¹ who collected it in Fosters Pond, Essex County, 1957. In the next County to the south, Suffolk, Dr. Harris also reported it in abundance in Muddy River, The Fenway, Boston. South of Boston, the present writer has seen a specimen from the sandy shore of Nippenicket Pond, Bridgewater, Plymouth County (*Frank C. Seymour*, 4426, 1935; a sterile specimen in the New England Botanical Club Herbarium).

The range of *Cabomba* extends westward into Worcester County. The specimens documenting this distribution are filed in the Hadwen Herbarium of Worcester County Plants, Clark University, Worcester. The earliest collection was from Uxbridge, in the Mumford River (*Walter H. Hodge*, 2825, 1933). Again in Uxbridge, it was found in great abundance; the long streamers,² having been washed up by a hurricane, were floating along the shore of Ironstone Reservoir. A random specimen measured 85+ inches long (*F. C. Seymour and B. N. Gates* 32316, 1954). Nine years previous, it had been collected as an occasional plant in Ironstone Brook at Ironstone Road, which is fed by Ironstone Reservoir (*B. N. Gates* 23914, 1946). In the southeast town in Worcester County, Blackstone, in the Blackstone River, two or three feet deep, *Cabomba* covered the bed of the river (*Malumphy* 24893, 1943).

Distribution in Worcester County extends west considerably beyond the geographical center of the State. On a field trip of the New England Botanical Club it was first collected floating along the north-east shore of Quaboag Pond near the inlet of Seven Mile River (*David Potter* 24913, 1946). At this station, it has been observed nearly every year since and was collected in May 1955 (*Winifred C. Gates* 31976). That there is no association by water-courses between this East Brookfield station and

¹ RHODORA 60: 116, 1958.

² A profusion of amazingly long streamers of *Myriophyllum humile* forma *capillaceum* tangled with *Cabomba*; the collected specimen measured in excess of 11.5 feet long (*F. C. Seymour and B. N. Gates* 31995).

the two towns, Uxbridge and Blackstone, is quite evident; East Brookfield is in the water-shed which empties into the Thames River in Connecticut, while the two other towns are in the Blackstone River water-shed, draining south through Rhode Island.

Westward from Worcester County, Fassett,³ without a specific citation, lists an occurrence in "western Massachusetts, where perhaps introduced", is interpretable as most any locality west of the Connecticut River. It is quite probable, however, that his citation refers to the collection in 1930 by Wayne E. Manning⁴ in Hatfield, Hampshire County. He found it very abundant in South Pond, once a very old ox-bow of the Connecticut River. A local florist and fisherman, Harold Keys, is quoted by Manning as having known it in profusion in this pond for at least a decade previous and as having suggested that it appeared to be indigenous.

To round out the statement of occurrence of *Cabomba* in southern New England, it may be helpful to cite briefly two collections in Connecticut, which have been seen by the writer. Ultimately, it might develop that they have some relationship to the Massachusetts station in the Connecticut River Valley water-shed. In Rogers Pond, Saybrook, Middlesex County, it was reported to be very abundant (*E. H. Eames 11854a*, 1937; a specimen in flower at the Gray Herbarium). In a pond at the south-west base of Chestnut Hill, Trumbull, Fairfax County, it has been long established, according to the property owner. (*E. H. Eames 11874*, 1937; a specimen in flower in the Gray Herbarium).

Sterile *Cabomba* has a reasonable resemblance to several other aquatics found in our New England waters. For this reason and because in the writer's experience it is seldom found in flower or fruit, at least in Massachusetts, it may be readily overlooked or mistaken for one of several plants of ponds and streams. Sterile specimens of *Cabomba* have the general appearance of *Ceratophyllum demersum* L., *Megalodonta Beckii* (Torr.) Greene, *Ranunculus flabellaris* Raf. and to some forms of *Myriophyllum*. Distinguishing characters of the stem and leaves of these are very helpfully pictured by W. C. Muenscher, in comparison with the

³ Manual of Aquatic Plants, 1940.

⁴ RHODORA 39: 187.

stem and leaves of *Cabomba*, on a plate in his "Aquatic Plants of United States".⁵ Observe that *Cabomba* has a well developed petiole without stipules.

Conclusions are few, beyond the fact that *Cabomba* is locally widespread in Massachusetts. The earliest collection known in Massachusetts was in 1930, in Hatfield, Hampshire County, followed in Worcester County, in Uxbridge, in 1933. In the writer's experience, supported by the collections of others, it is locally plentiful and well established. Regrettably, the writer has yet to see it in flower or fruit in the area (although the two Connecticut collections were in flower). Occurrence in Massachusetts constitutes an extension considerably north of the normal range given in Gray's Manual, ed. 8, as Virginia, or, by Fassett, as New Jersey. Each of these authors would account for the New England extension as "naturalized" or "perhaps introduced" through some unexplained means. Its scattered but established distribution anticipates that further collections should show a more unified occurrence of *Cabomba* in southern New England.—
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FURTHER NEW RECORDS OF MYRTACEAE FROM JAMAICA

GEORGE R. PROCTOR

Recent botanical exploration by the writer in Jamaica has revealed an interesting series of new plant records. A previous number of *RHODORA* (50: 303-306. 1957) presented a few notes on *Eugenia* and proposed one new species. The present paper contributes more new Jamaican records in the Myrtaceae. The writer is grateful to Dr. Lily M. Perry for her assistance with the Latin descriptions.

Calyptranthes clarendonensis Proctor, sp. nov. Frutex circa 2.5 m. altus; ramulis novellis fere teretibus, dense brunneo-tomentosis. Folia sessilia, rigide coriacea, opaca, non pellucido-punctata, supra glabra, subtus decidue brunneo-tomentosa, 2.5-5 cm. longa, 1.5-4.5 cm. lata, late ovata, apice obtusa, basi valde cordato-subamplexicaule, nervo medio supra basin versus impresso, subtus prominente, venis secundariis prominulis. Inflorescentiae 2-4, subterminales, apice 2-3-florae, floribus sessilibus. Alabastra ovoidea, apiculata, 5-6 mm. longa, dense brunneo-

⁵ Ithaca, N. Y., 1944, plate 102a, page 232.

tomentosa. Flores aperti non visi. Baccae globosae (interdum irregulariter globosae), brunneo-tomentosae, 9-14 mm. diametro; seminibus 2-13, 6-9 mm. longis.

Shrub c. 2.5 m. tall; youngest branchlets nearly terete, densely brown-tomentose. Leaves sessile, rigidly coriaceous, opaque and without pellucid dots, glabrous above, deciduously brown-tomentose beneath, 2.5-5 cm. long, 1.5-4.5 cm. wide, broadly ovate, blunt at apex and rather deeply cordate-clasping at base, midrib impressed toward the base above, prominent beneath, secondary venation prominulous on both sides. Inflorescences 2-4, subterminal (i.e., accompanied and overtopped by a pair of leafy shoots which appear simultaneously from the same place); peduncles 2-5 cm. long, somewhat compressed or 2-edged, brown-tomentose, each bearing 2 or 3 sessile flowers at the apex. Buds ovoid-apiculate, 5-6 mm. long, densely brown-tomentose. Open flowers not seen. Berries globose (sometimes irregularly), brown-tomentose, 9-14 mm. in diameter, 2-13-seeded, the seeds 6-9 mm. long.

TYPE: Parish of Clarendon, Peckham Woods, elev. c. 2500 ft., on rocky limestone hilltop, *Proctor 11399*, collected Dec. 23, 1955. Holotype at the Institute of Jamaica; the type material is in fruit.

ADDITIONAL SPECIMENS: from the same locality, *Webster & Proctor 5392*, with young fruits (Herb. Arnold Arboretum); *Proctor 9760*, January 7, 1955, with buds and fruits.

The present new species was for a time doubtfully identified with *C. mazonii*, but clearly differs from that species in its terete, tomentose branchlets; larger and more deeply cordate leaves; longer peduncles bearing but 2 or 3 sessile flowers (instead of "3 heads of (to 12) sessile flowers, the 2 lateral heads more or less stalked"); and much larger buds. The fruits of *C. mazonii* evidently are not known; those of *C. clarendonensis* tend to have more seeds than is usual in this genus.

From *C. cardiophylla* Urb. of eastern Cuba, with which *C. clarendonensis* seems to show a near relationship, the latter differs by the leaves entirely lacking the "densely impressed-punctate" character of the upper surface and by differences in the nature of the pubescence. The flowers and fruits of *C. cardiophylla* were unknown to Urban, but more recently-collected material (*Alain 3352*), with buds, suggests that these structures are smaller in the Cuban species.

Calyptanthus ekmanii Urban, Ark. Bot. 22A (10): 32. 1929. Sterile material apparently conspecific with this small tree of southwestern Haiti has been collected in moist elfin woodland on the east slope of the John Crow Mountains, Parish of Portland, *Proctor 9820*. This is a new record for Jamaica.

Myrcia skeldingi Proctor, sp. nov. Arbuscula circa 5 m. alta; ramulis, petiolis, nervo medio foliorum subtus, et inflorescentiae ramis superioribus sparsim strigillosis, deinde glabratiss. Folia coriacea et sine punctis pellucidis, subsessilia (petiolis crassis, 1–2 mm. longis), 5.5–10 cm. longa, 3.5–6 cm. lata, late elliptica vel ovato-elliptica, apice plerumque rotundata vel obtusa, basi subcordata vel rotundata, nervo medio supra impresso, subtus prominente, venulis crebris et tenuibus reticulatis utrinque sed praecipue subtus prominulis. Paniculae terminales multiflorae, plerumque 7–14 cm. longae lataeque, pedunculo 0.5–1 cm. longo, ramis ultimis plerumque dichasiam 3–5-floram terminalem ferentibus. Tubus calycis 1.5 mm. longus, glaber, paulum supra ovarium productus, 4-lobatis, lobis circa 0.75 mm. longis; petalis albis, glabris, ca. 1 mm. longis; antheris bilocularibus; stylo ca. 3.5 mm. longo, stigmate peltato. Baccae globosae, glabrae, ca. 6 mm. diametro, maturae rubrae, seminibus 1–3, (3)–4 mm. longis.

Small tree c. 5 m. tall; youngest branchlets, petioles, midribs of leaves beneath, and upper inflorescence-branches sparsely strigillose, all parts becoming glabrate with age. Leaves coriaceous and without pellucid dots, subsessile (petioles thick, 1–2 mm. long) 5.5–10 cm. long, 3.5–6 cm. wide, broadly elliptic or ovate-elliptic, the blades mostly rounded or blunt at the apex, with base subcordate or rounded; midrib impressed above, prominent beneath, the finely-reticulate venation prominulous on both sides but especially beneath. Panicles terminal, many-flowered, mostly 7–14 cm. long and broad, the basal stalk (peduncle) 0.5–1 cm. long, the ultimate branches mostly ending in 3–5-flowered dichasia. Calyx with tube 1.5 mm. long, glabrous, slightly prolonged above the ovary, 4-lobed, the lobes c. 0.75 mm. long; petals white, glabrous, c. 1 mm. long; anthers 2-celled; style c. 3.5 mm. long, with peltate stigma. Berries globose, c. 6 mm. in diameter and deep red when ripe, with 1–3 seeds, these (3)–4 mm. long.

TYPE: Parish of Clarendon, Mason River Savanna, 2.75–3 miles north-west of Kellits, elev. c. 2300 ft., in thickets along stream, *Proctor 16478*, collected July 9, 1957. Holotype at the Institute of Jamaica; the type material has flowers and young fruits.

ADDITIONAL SPECIMEN: from the same locality, *Proctor 16734*, collected Oct. 14, 1957, with ripe fruits.

* *Myrcia skeldingi* is easily distinguished from other Jamaican congeners (and most species elsewhere) by its subsessile, more or less subcordate, blunt-tipped leaves and 4-lobed calyx. In the latter character it is an anomalous member of its genus. This species shows a rather close resemblance to a group of Brazilian forms, especially *M. uberavensis* Berg (= *M. cardiophylla* Reicht. ?), but the latter clearly differ in having 5-parted flowers and in other individual details.

Named for Prof. A. D. Skelding of the Department of Botany, University College of the West Indies, who first pointed out to the

writer the botanical richness of the Mason River Savanna area where this species is apparently endemic.

Eugenia jeremiensis Urb. & Ekm., Ark. Bot. 24A (4): 29. 1931. JAMAICA: Parish of Hanover, interior summit slopes of Dolphin Head, on moist wooded limestone hillside, Proctor 10032 and 10416.

The specimens cited above were originally believed by the writer to represent an undescribed species, but subsequent comparison with type material of *E. jeremiensis* (from southwestern Haiti) strongly suggests that they are conspecific. Ekman's specimens of the latter species in the Institute of Jamaica herbarium are, however, sterile, and the Jamaican plants may yet prove to be different. In any case, this material represents a new record for Jamaica. It can be described as follows:

Shrub or small tree reaching at least 5 m. in height; branchlets terete or slightly compressed near the end, glabrous. Leaves coriaceous, glabrous, 10-12 cm. long by 7-9 cm. broad, ovate-orbicular with rounded apex, the base of the blade broadly cuneate, dark green above and paler beneath with numerous minute faintly pellucid punctate dots; midrib slightly impressed near the base on the upper side, but flat or slightly raised toward the apex, very prominent beneath, especially near the base, with side-veins and venules prominulous on both sides; petioles thick, furrowed above, 2-3 mm. long. Flowers paired in the upper leaf-axils; pedicels 2.5 cm. long, stout (1-1.5 mm. in diameter); bracteoles united at the base, broadly deltoid-ovate, obtuse, 1 mm. long; sepals apparently roundish, unequal, the longer 1.4 cm. long, the shorter 1 cm. long (seen in bud only). Expanded flowers and fruits not seen.

The flowers of this species, when open, must be larger than those of any other indigenous *Eugenia*.—INSTITUTE OF JAMAICA, KINGSTON, JAMAICA, W.I.

TYPIFICATION OF THE GENUS *FORESTIERA*
(OLEACEAE)¹

In preparing the treatment of the genera of the Oleaceae of the southeastern United States, I found it necessary to determine the type of the genus *Forestiera*. Two different species have already been chosen as the type, and the problem was to discover which one was correct. *Forestiera acuminata* (Michx.) Poir. was designated by Britton and Brown (Ill. Flora ed. 2. 2: 278. 1913) and by A. Rehder (Bibl. Cult. Trees & Shrubs p. 576. 1949) as the type of the genus while M. C. Johnston (Synopsis of the United States species of *Forestiera* (Oleaceae). Southwestern Nat. 2: 141. 1957 [1958]) maintained that the type species is *Adelia porulosa* Michx. After reviewing the literature, however, I have reached still another conclusion.

The genus *Adelia* was described by Patrick Browne in 1756 (Civ. Nat. Hist. Jamaica p. 361), but he listed only the polynomial "ADELIA I. *Foliis obovatis, oppositis; spicillis alaribus* [sic]; *cortica cinereo*," and made no binomial combination. He did, however, include a short description and an illustration of the male plant (Tab. 36, fig. 3) which he said was "common in the low gravelly hills eastward of Kingston."

Michaux (Flora Boreali-Americana 2: 223. 1803) adopted the name *Adelia* ("ADELIA. Brown.") and described three species, making the proper binomial combinations. These species were *Adelia porulosa* ("HAB. in maritimus Floridae"), *A. ligustrina* ("HAB. in fruticetis Illinoensibus, Tennessee, &c"), and *A. acuminata* ("HAB. ad ripas fluviorum Carolinae et Georgiae). Browne's plant was not named by Michaux.

Willdenow (Sp. Pl. ed. 4. 4: 711. 1806) proposed the name *Borya* for the genus, and listed "*Adelia* Mich. amer. 2. p. 223" in synonymy. He included 4 species in his treatment: *Borya cassinoides* Willd., based on Browne's description and also a Richard specimen ("*Habitat in Antillis*"); *Borya porulosa* Willd., based on *Adelia porulosa* Michx. ("*Habitat in maritimis Floridae*"); *Borya ligustrina*, and *Borya acuminata*. Willdenow, therefore, included Michaux's three species in his treatment, but,

¹ Continuing a series of miscellaneous notes and papers on the flora of the southeastern United States made possible through the interest and support of George R. Cooley and a grant from the National Science Foundation.

in addition, described and named Browne's plant upon which the genus *Adelia* was based. The name *Borya* Willd., however, was a later homonym of *Borya* Labill. (Liliaceae).

Forestiera was the name proposed for this genus in 1810 by Poiret (Encycl. Méth. Suppl. 1: 132. 1810) who cited both *Adelia* Michx. and *Borya* Willd. in the synonymy. Among the four species listed by Poiret (op. cit. 2: 663-665. 1811 [1812]) are *Forestiera cassinoides*, based on *Borya cassinoides* Willd. and Browne's description and figure ("Cette plante croît aux Antilles. (Herb. Richard.)") and *Forestiera porulosa*, based on *Borya porulosa* Willd. and *Adelia porulosa* Michx. ("Cette plante croît dans la Floride, sur les côtes de la mer.").

It is clear, then, that Patrick Browne's plant bears the specific epithet *cassinoides*, (not *porulosa*). Moreover, since this is the species upon which P. Browne's *Adelia* is based (and therefore also *Borya* Willd. and *Forestiera* Poir.) it should be considered as the type of the genus. Since *Adelia* L. (Euphorbiaceae) has been conserved over *Adelia* Browne, the correct name for the genus is *Forestiera* Poir., but the type remains the same.

The type species of the genus *Forestiera* is *Borya cassinoides* Willd. (= *Adelia cassinoides* (Willd.) O. Ktze. = *Forestiera cassinoides* (Willd.) Poir.).—KENNETH A. WILSON, GRAY HERBARIUM AND ARNOLD ARBORETUM.

A NEW RHODODENDRON STATION IN MAINE.—As a result of an intensive botanical and horticultural study of native *Rhododendron maximum* colonies in Maine and New Hampshire, one hitherto unreported stand has come to our attention. Professor Elwyn Meader of the Department of Horticulture, University of New Hampshire learned of it first and called it to the attention of the senior author.

A visit was made by the authors and notes taken on November 4, 1957. This is a very small colony consisting of rather uniform plants standing about 2½ feet high and covering an area about 10 feet long and 6 feet wide. It is situated a short distance in from the north shore of Horn Pond, Acton, York County, Maine, and is not more than ¼ mile from the Maine-New Hampshire boundary. The environment is a mixed forest on a gentle south-facing slope. Deciduous species predominate but some large trees of *Pinus*

Strobilus and *Tsuga canadensis* occur not far away. The *Rhododendrons* are obviously young and it might be thought, therefore, that the colony is new and was established there recently either with the help of man or by means of natural migration. However, there is no information that the colony was planted nor is it likely that an attractive ornamental species would be planted in this kind of situation. The nearest known natural colony is the well known one in Sanford which is more than 11 miles away. It seems improbable that *R. maximum* with its particularly relic character in New England traversed this distance in recent years.

It may be more reasonable to conclude that there was formerly a larger colony in the area. Lumbering which is known to us as having been disastrous to other *Rhododendron* stands was formerly carried on at the Acton site and probably resulted in the almost complete destruction of the *Rhododendrons*. Fortunately, a few have survived. Now it will be interesting to see if it will regain its former abundance in future years.—RADCLIFFE PIKE AND A. R. HODGDON, DEPARTMENT OF HORTICULTURE AND DEPARTMENT OF BOTANY, UNIVERSITY OF NEW HAMPSHIRE, DURHAM.

THE TYPE OF *VAUCHERIA COMPACTA* var. *KOKSOAKENSIS*.—In describing this variety on page 286 of *Rhodora*, Volume 60, we inadvertently neglected to cite the type specimen. The following should have appeared on that page. TYPE: *R. C. Wilce 830*, collected on the eastern shore near the mouth of the Koksoak River, Québec, Canada, Sept. 1, 1955, in the herbarium of the New York Botanical Garden.—JOHN L. BLUM AND ROBERT T. WILCE.

Volume 60, No. 719, including pages 289–308, was published 15 December, 1958.

ERRATA.

Cover, No. 710, line 3; for **Mid-arrowed**, read **Mid-arrowhead**.

Cover, No. 710, line 7; for **Glen J. Winterringer** read **Glen S. Winterringer**.

Page, 34, line 7; for *repens*, read *reptans*.

Page 37, line 15; for *repens*, read *reptans*.

Page 41, line 29; for listed either, read listed either because.

Page 48, line 12; for Colorado, read southern Alberta.

Page 58, line 4; for Fasset, read Fassett.

Cover, No. 711, line 9; for 76, read 86.

Page 90, line 32; for constancy, read consistency.

Page 272, line 7; for oppositis supra, alternis infra; read oppositis infra, alternis supra.

Page 282, line 11; for mm., read m.

Page 282, line 16; for 10-14 cm., read 10-14 mm.

Page 282, line 27; for hirsute, read hispid.

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